

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ronald A. Rudder on October 19, 2009.

2. The application has been amended as follows:

IN THE CLAIMS:

- Claim 1 is amended as follows:

Claim 1 (Currently Amended): A photon emitter comprising: a photon generator configured to generate randomly polarized photons separable into a first polarisation state and a second polarisation state, the first polarisation state being orthogonal to the second polarisation state; and

time delay means receiving said randomly polarized photons and being configured to delay photons having the second polarisation state with respect to those having the first polarisation state such that photons which enter the time delay means with the first polarisation exit the time delay means at a different time to photons which enter the time delay means with the second polarization~ and

encoding means, wherein photons which have passed through the time delay means are passed into an encoding means,

wherein the encoding means are configured to encode the phase of a photon and comprise an interferometer, said interferometer comprising an entrance coupler connected to a long arm and a short arm, said long arm and short arm being joined at their other ends by an exit coupler, one of said arms having a phase modulator which allows the phase of a photon passing through that arm to be set to one of at least two values,

wherein said encoding means are configured to rotate the polarisation of the delayed photons through a different angle than the polarisation of the non-delayed photons, such that photons generated with either the first or second polarisation state exit the encoding means with the same polarisation state.

wherein said encoding means are configured to encode the phase of a photon and comprise a first interferometer, said interferometer comprising an entrance coupler connected to a long arm and a short arm, said long arm and short arm being joined at their other ends by an exit coupler, one of said arms having first phase variation means which allows the phase of a photon passing through that arm to be set to one of at least two values,

wherein the photons are received by a receiver, and the receiver comprises a second interferometer, the second interferometer comprising an entrance coupler connected to a long arm and a short arm, said long arm and short arm being joined at their other ends by an exit coupler, one of said arms having second phase variation means which allows the phase of a photon passing through that arm to be set to one of at least two values; and

further comprising directing means configured to ensure that photons which have passed through the short arm of the first interferometer are directed down the long arm of the second interferometer and photons which have passed through the long arm of the first interferometer pass through the short arm of the second interferometer.

wherein the directing means comprises first polarising means configured to allow photons which have travelled through different arms of the first interferometer different polarisations and second polarising means which distinguish between the photons having different polarisations and direct them down the appropriate arm of the second interferometer.

- Claim 11 has been cancelled.
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. L./
Examiner, Art Unit 2613

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613